WHAT IS CLAIMED IS:

1. A method for detecting gunked and cracked ultrasonically tuned blades in an ultrasonic surgical system, comprising the steps of:

applying a drive signal having a drive current level and a drive voltage level to an ultrasonic hand piece/blade using an ultrasonic generator;

obtaining impedance data for the hand piece/blade;

comparing the impedance data to determine whether the impedance data is within acceptable limits; and

if the impedance data is with acceptable limits; displaying a message on a liquid crystal display of the generator.

2. The method of claim 1, wherein the step of applying the drive signal comprises exciting the hand piece with an ultrasonic signal across a predetermined frequency range.

3. The method of claim 2, wherein the predetermined frequency range is from 50 kHz to 60 kHz.

4. The method of claim 1, wherein said obtaining step comprises the steps of

obtaining magnitude impedance data and impedance phase data for at least two excitation levels over a prescribed range.

5. The method of claim 4, wherein the prescribed range is from 5mA to 50mA.

6. The method of claim 1, wherein said comparing step comprises the step of:

comparing at least one of a magnitude of a lowest impedance, a maximum phase between the drive current and the drive voltage, a blade resonance frequency to at least one of a non-linearity and an evaluation of a continuousness of the data obtained.

7. The method of claim 6, further comprising the step of:

displaying a first message on the liquid crystal display, if any impedance data sweep at a lower excitation level reveals a minimum impedance magnitude which is less than a minimum impedance magnitude obtained at a higher excitation level; and

displaying a second message on the liquid crystal display, if any impedance data sweep at a lower excitation level reveals one of a minimum impedance magnitude which is unchanged and a higher minimum impedance than the minimum impedance magnitude obtained at the higher excitation level.

8. The method of claim 7, wherein the step of displaying the first message comprises displaying a "Blade Cracked" message on the liquid crystal display.

9. The method of claim 7, wherein the low excitation level ranges from 5mA to 25mA.

10. The method of claim 7, wherein the high excitation level ranges from 25 mA to 500mA.

11. The method of claim 7, wherein the step of displaying the second message comprises displaying a "Blade Gunked" message on the liquid crystal display.

12. The method of claim 7, further comprising the steps of:

computing excess heat generated on a sheath of the hand piece/blade.

13. The method of claim 12, wherein said excess heated is computed by calculating differences between impedance magnitudes.

14. The method of claim 13, wherein the difference between impedance magnitudes are displayed during the step of displaying the second message.

15. The method of claim 12, further comprising the steps of:

at least on of displaying a third message on the liquid crystal display, if said excess heat indicates that the hand piece/blade is hot; and

shutting down the ultrasonic surgical system.

16. The method of claim 15, wherein the step of displaying the third message comprises displaying a "Hot Hand Piece" message on the liquid crystal display.

17. A method for detecting gunked and cracked ultrasonically tuned blades in an ultrasonic surgical system, comprising the steps of:

obtaining impedance data for one of a new blade and a known blade;

applying a drive signal having a drive current level and a drive voltage level to an ultrasonic hand piece/blade using an ultrasonic generator;

obtaining impedance data for the hand piece/blade;

comparing the impedance data of ultrasonic hand piece/blade to the impedance data of one of the new blade and the known blade to determine whether the impedance data of the ultrasonic hand piece/blade is within acceptable limits; and

if the impedance data is with acceptable limits; displaying a message on a liquid crystal display of the generator.

18. The method of claims 17, wherein the step of applying the drive signal comprises exciting the hand piece with an ultrasonic signal across a predetermined frequency range.

19. The method of claim 18, wherein the predetermined frequency range is from 50 kHz to 60 kHz.

20. The method of claim 17, wherein said obtaining step comprises the step of:

obtaining magnitude impedance data and impedance phase data for at least two excitation levels over a prescribed range.

21. The method of claim 17, wherein the prescribed range is from 5mA to 50mA.

22. The method of claim 17, wherein said comparing step comprises the step of:

comparing at least one of a magnitude of a lowest impedance, a maximum phase between the drive current and the drive voltage, a blade resonance frequency to at least one of a non-linearity and an evaluation of a continuousness of the data obtained.

23. The method of claim 22, further comprising the step of:

displaying a first message on the liquid crystal display, if any impedance data sweep at a lower excitation level reveals a minimum impedance magnitude which is less than a minimum impedance magnitude obtained at a higher excitation level; and

displaying a second message on the liquid crystal display, if any impedance data sweep at a lower excitation level reveals one of a minimum impedance magnitude which is unchanged and a higher minimum impedance than the minimum impedance magnitude obtained at the higher excitation level.

24. The method of claim 22, wherein the step of displaying the first message comprises displaying a "Blade Cracked" message on the liquid crystal display.

25. The method of claim 23, wherein the low excitation level ranges from 5mA to 25mA.

26. The method of claim 23, wherein the high excitation level ranges from 25 mA to 500mA.

27. The method of claim 23, wherein the step of displaying the second message comprises displaying a "Extent of Gunk" message on the liquid crystal display.

28. The method of claim 23, further comprising the step of:

computing excess heat generated on a sheath of he hand piece/blade.

29. The method of claim 28, wherein said excess heated is computed by calculating differences between impedance magnitudes.

30. The method of claim 29, wherein the differences between impedance magnitudes are displayed during the step of displaying the second message.

31. The method of claim 28, further comprising the steps of:

at least one of displaying a third message on the liquid crystal display, if said excess heat indicates that the hand piece/blade is hot; and

shutting down the ultrasonic surgical system.

32. The method of claim 31, wherein the step of displaying the third message comprises displaying a "Hot Hand Piece" message on the liquid crystal display.

33. A method for determining a damping level of a hand piece/blade in an ultrasonic system, comprising the steps of:

applying a drive signal to a transducer of a hand piece/blade;

halting the drive signal briefly;

measuring piezo self-generated energy of the hand piece/blade;

measuring a relative dampening of the hand piece/blade;

determine blade motion status using blade characteristics; and

calculating a damping level of the hand piece/blade using one of a time period required for the blade characteristics to stop changing and a speed at which the blade characteristics change.

34. The method of claim 33, wherein the step of measuring the relative dampening of the hand piece/blade; comprises the step of:

performing sequential time measurements of the hand piece/blade characteristics;

wherein the characteristics of the hand piece/blade is at least one of impedance, voltage, current and capacitance.

35. The method of claim 34, wherein said performing step comprises the step of:

determining a valid frequency with which to measure the characteristics which are not corrupted by unwanted resonances;

driving the hand piece/blade at resonance and abruptly removing the drive signal; and

measuring the characteristics at least once over a period of time.

36. The method of claim 35, wherein the period of time is three hundred milliseconds.

37. A method for determining a relative dampening level of a blade in an ultrasonic system, comprising the steps of :

driving a hand piece/blade using an ultrasonic generator;

performing frequency domain measurements of the hand piece/blade to obtain frequency domain data;

comparing the frequency domain data to a predetermined threshold; and

if the frequency domain data is less than the predetermined level, displaying a message on a liquid crystal display of the generator.

38. The method of claim 37, wherein the step of displaying the message comprises displaying a "Hand Piece Gunked" message and displaying a level of hand piece/blade damping on the liquid crystal display.

39. The method of claim 37, wherein the predetermined level is approximately 45 ohms

40. The method of claim 37, wherein the measurements are obtained when at least one of initiated by a user and automatically when an impedance of the hand piece/blade is distinctly low.

41. A method for determining relative level of dampening of a hand piece/blade in an ultrasonic system, comprising the steps of:

driving the hand piece/blade at a first signal level using an ultrasonic generator;

determining a first time for the hand piece/blade to reach a resonance plateau;

removing the drive signal from the hand piece/blade;

driving the hand piece/blade at a second signal level using the ultrasonic generator;

determining a second time for the hand piece/blade to reach the resonance plateau;

comparing the first time to the second time;

if the first time is substantially greater than the second time, displaying a first message on a liquid crystal display of the generator; and

if the first time is approximately equal to the second time; displaying a second message on a liquid crystal display of the generator.

42. The method of claim 41, wherein the first message is a "Blade Gunked" message.

43. Then method of claim 41, wherein the second message is a "Blade is Good" message.

44. The method of claim 41, wherein the first signal level is approximately one of 282 mA peak and 200 mA RMS.

45. The method of claim 41, wherein the second signal level is approximately one of 564 mA peak and 425 mA RMS.